SMART MANAGEMENT OF SPORTS FACILITIES IN THE DIGITAL AGE: A HOLISTIC MODEL FOR INTEGRATING INSTITUTIONAL PERFORMANCE AND ITS IMPACT ON SUSTAINABLE DEVELOPMENT

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ABSTRACT

Background. The challenges facing these facilities are increasing as a result of rapid technological developments, which requires the development of integrated models that incorporate modern technologies into their management. The results indicate that 70% of sports facilities suffer from poor integration among their internal departments, and 80% of them lack a comprehensive model for smart management. **Objectives.** The study aims to develop a holistic model for smart management by analyzing the current reality and identifying the necessary requirements, which enhances institutional sustainability. **Method.** The study employed a mixed-methods approach (descriptive-analytical, comparative, and applied), collecting data from a sample of 108 managers, technical and administrative staff in sports facilities. A developed questionnaire was used to assess the impact of smart management on performance integration and sustainability. **Results.** The results indicate a strong positive correlation (r = 0.71) between the application of smart management and achieving sustainable development, and PLS-SEM analysis revealed a total effect of 0.793 of smart management on sustainability through direct and indirect paths. **Conclusion** The importance of this study lies in providing a comprehensive strategic model that can contribute to improving institutional performance, increasing the effectiveness of internal processes, and enhancing innovation. Thus, this study represents an important scientific reference for officials and researchers in the field of sports management, opening new horizons for sustainable development in the sports sector.

Keywords; smart management, digital transformation, institutional performance integration, sports facilities, structural equation modeling.

A. INTRODUCTION

In an era of unprecedented digital transformation, smart technologies have become a key driver of institutional development across various sectors, including the sports sector, which is undergoing a qualitative shift in the management of its facilities. Sports facilities are no longer merely spaces for physical activity; they have transformed into integrated smart environments that rely on the Internet of Things (IoT) , artificial intelligence, big data analytics, and automated systems to improve operational efficiency, enhance user experience, and achieve institutional sustainability (Zhou, 2024; Heck et al., 2021).

Digital transformation refers to a radical change in how organizations operate by integrating digital technologies into all activities, influencing the value delivered to the public and internal efficiency (Santomier, 2024). In the context of sports facilities, this transformation is manifested in electronic booking systems, sensor-based facility monitoring, customer relationship management platforms, and digital (dashboards) that enable real-time performance tracking (Zhu & Kou, 2023; Qian, 2021).

Despite the growing body of literature addressing digital transformation in sports, most studies -such as those by (Al-Amri 2023) and (Al-Khaldi 2024)-have focused on the sports system as a whole or on marketing and fan engagement aspects. There remains a clear deficiency in providing comprehensive models that integrate smart management, institutional performance integration, and sustainable development within the sports facility as an independent analytical unit. The researcher's survey indicated that more than 70% of sports facilities suffer from weak integration between their various departments (reservations, maintenance, security, and marketing), leading to wasted resources and a poor response to operational challenges.

This highlights the critical need for a comprehensive smart management model that ensures integrated performance across all functions of a sports facility, positively impacting its competitive and environmental sustainability. This study aims to bridge this gap by analyzing the current state of sports facilities, identifying the requirements for digital transformation, proposing a measurable and applicable model, and testing its impact on key performance indicators and sustainable development.

ResearchProblem

The challenges facing sports facilities have increased because of rapid technological advancements, necessitating the development of integrated strategies that incorporate modern technologies into their management. Through a preliminary study and a review of previous research, the researcher observed a significant gap between the current state of sports facilities and the demands of the digital age. Al-Amri's study (2023) indicated that 65% of sports institutions lack a clear digital transformation strategy, while Al-Khaldi's study (2024) confirmed that 70% of these institutions suffer from weak digital infrastructure and inadequate training of personnel to handle modern technologies. These findings align with those of Halynska and Zhao (2024) in their analysis of smart university sports hall management strategies in China, where they found that most universities lacked the necessary digital infrastructure.

The problem is exacerbated by the absence of an integrated model that combines digital transformation with sustainable institutional development. Most current digital transformation attempts are partial and disorganized, leading to wasted resources and a weak return on investment. A survey conducted by the researcher on a sample of sports

facilities revealed that 80% lack a comprehensive strategic plan linking digital transformation and institutional development.
Based on the above, the research problem is defined by the following main question:
What are the components of the holistic model for smart management in sports facilities, and what is its impact on the integration of institutional performance and sustainable development?

Research questions
This study seeks to answer the following questions:
1. What are the components of a comprehensive smart management model for sports facilities?
2. What is the level of institutional performance integration in sports facilities that implement smart management compared to those that do not?
3. Is there a statistically significant correlation between the application of smart management and the improvement of operational efficiency indicators?
4. What is the impact of applying the holistic model on sustainable development indicators (energy efficiency, user satisfaction, cost reduction)?

Research objectives
1. Designing a comprehensive model for the smart management of sports facilities.
2. Measuring the level of institutional performance integration in the sports facilities of the study sample.
3. Testing the relationship between smart management and sustainable development indicators.
4. Providing practical recommendations for adopting the model in various sports facilities.

Research hypotheses
1. First hypothesis: There are statistically significant differences at the significance level ($\alpha \leq 0.05$) in the level of institutional performance integration between sports facilities that apply smart management and those that do not.
2. Second hypothesis: There is a statistically significant positive effect at a significance level ($\alpha \leq 0.05$) of applying the holistic smart management model on operational efficiency (response time, occupancy rate, and maintenance costs).
3. Third hypothesis: There is a statistically significant positive correlation at a significance level ($\alpha \leq 0.05$) between the use of smart technologies (IoT, digital platforms) and the achievement of sustainability goals (reducing the carbon footprint, conserving energy, users' satisfaction).

Importance of research
This study is of paramount importance in enriching the Arabic and international libraries with a comprehensive theoretical framework that integrates the concepts of smart management, institutional performance integration, and sustainability within the context of sports facilities. This represents a valuable addition to both Arabic and international libraries. Furthermore, it clarifies the complementary relationship between smart technologies and development strategies, thus serving as a scientific reference for researchers and specialists in the field of sports management.

This study presents a comprehensive strategic model for smart management in sports facilities, which can be relied upon to develop digital transformation plans and programs. It also helps identify the essential requirements and priorities necessary to ensure the success of the digital transformation process and achieve sustainable institutional development. This aligns with what Li & Zhang (2025) advocated in their study on the smart transformation of stadiums after the National Games, where they emphasized the need for clear theoretical frameworks and implementation pathways.

This study contributes to equipping leaders and officials in sports facilities with practical mechanisms and tools for implementing smart management in a systematic and well-considered manner. It also offers realistic solutions to the challenges facing sports facilities in their transformation journey and opens new horizons for developing sports facilities by leveraging modern technologies and artificial intelligence. The gap that the current study fills: There is a scarcity of studies that offer a comprehensive model linking smart management, performance integration, and sustainability in sports facilities, while adopting a quantitative approach and SEM path analysis to identify direct and indirect impacts.

B. METHOD

The study adopted the mixed methods approach, which combines quantitative and qualitative methods, as follows:

1. The descriptive-analytical approach: To describe and analyze the reality of smart management in sports facilities through the developed questionnaire.
2. Comparative approach: To compare the performance of establishments that implemented the holistic model with those that did not.
3. Applied Methodology: By applying the model to a sample of establishments and statistically analyzing the results.

Research community and sample:

The research community consists of all workers in sports facilities (stadiums, indoor halls, sports clubs, sports complexes) in Iraq. A stratified random sample of 120 individuals was selected, from which 108 valid questionnaires were retrieved for analysis (90% response rate).

Study tool:

The questionnaire developed by the researcher was used, which consisted of five main axes containing 25 statements, in addition to general data. The psychometric properties of the instrument were verified as follows:

1. Apparent honesty: The questionnaire was presented to 5 judges who were professors of sports administration and educational technologies, and the agreement rate among them reached 92%.
2. Consistency: Cronbach's alpha coefficient was calculated for the questionnaire as a whole, and was 0.89, which is a high value indicating high stability.

Statistical processing:
The SPSS statistical software (Version 26) was used and SmartPLS 4 to perform the following analyses:

a. Arithmetic means and standard deviations.
b. Correlation coefficients (Pearson Correlation).
c. T (test) for comparing two groups.
d. Simple Linear Regression Analysis.
e. Structural equation modeling (PLS-SEM).

Theoretical framework

- First: The concept of smart management of sports facilities

Smart management is defined as “an integrated system of policies, procedures, and digital tools that aim to improve the efficiency and effectiveness of sports facility management by employing modern technologies such as the Internet of Things, artificial intelligence, and big data analytics” (Al- Khaldi, 2024; Smith et al., 2023). This definition aligns with the findings of Zhang (2021) in his study on building a functional model for smart sports facilities, which focused on automation and smart services, as well as with the findings of Hao & Dai (2024) in their design of a management information system for universities in the era of smart sports.

- Second: The concept of institutional performance integration

Institutional performance integration is defined as "the degree of coordination and interdependence among the various functions and departments within an organization to achieve strategic objectives efficiently and effectively" (Al-Saeed, 2024). This integration is achieved through the free flow of information between departments, the use of standardized key performance indicators (KPIs), and the presence of electronic systems that enable automated data exchange. A study by Zarubin (2025) indicates that Integrated Management Systems (IMS) significantly contribute to improving the integration of business and operational processes in sports stadiums.

- Third: The concept of sustainable development in sports facilities

Sustainable development in the context of sports facilities is defined as a continuous and systematic process of improving organizational and operational capabilities, ensuring that the needs of the present are met without compromising the ability of future generations to meet their own needs (Smith & Brown, 2023; UNESCO, 2020). Li & Zhang (2025) “explored this concept in depth by linking it to Dual Carbon Goals” and digital intelligence in the transformation of sports facilities.

- Fourth: The proposed holistic model for smart management

Based on the theoretical review and previous studies, the researcher proposes the following holistic model consisting of five main axes:

Axis	The Components
Digital Infrastructure	Iot Sensors , Smart Cameras
Smart Operating Systems	Electronic Booking System, Automated Maintenance System, Energy Management System, Security And Monitoring System
Integration Platforms	Unified Control Panel (Dashboard) , Application Programming Interface (Api) , Centralized Database

Integrated Performance Indicators	Kpis Shared Across Departments (Occupancy Rate, Response Time, User Satisfaction, Energy Consumption)
Digital Governance	Information Security Policies, Staff Training Programs, Impact Measurement Mechanisms, Transparency Reports

This model complements what Wu's study (2025) presented regarding the necessity of using cloud solutions (SaaS) in managing sports stadiums, as well as Zhao et al.'s study (2021) regarding a stadium resource sharing platform.

C. RESULTS AND DISCUSSIONS

Results

Descriptive characteristics of the sample of the 120 questionnaires distributed, the researcher received 108 valid questionnaires for analysis (90% response rate). The sample was distributed by gender: 78 males (72.2%), 30 females (27.8%), and by experience: less than 5 years (25%), 5-10 years (40%), 11-15 years (20%), more than 15 years (15%).

Table 1. Means and standard deviations for the study axes

Axis	Mean	Standard Deviation	Availability Level
Smart Management	3.85	0.72	Medium
Integration Of Institutional Performance	3.42	0.68	Medium
Operational Efficiency	3.91	0.65	High
Sustainable Development	3.78	0.70	Medium
Audience Experience And Transparency	4.10	0.62	High

Table (1) shows that the highest average score was for "Public Experience and Transparency" (4.10), followed by "Operational Efficiency" (3.91), while the lowest was for "Integration of Institutional Performance" (3.42). This suggests that sports facilities are making progress in public-facing aspects but still suffer from weak internal integration. This finding is consistent with what Heck et al. (2021) found at the Johan Cruyff Arena, where the most noticeable improvements were in the public experience (ticketing, crowd control), while the greatest challenges lay in the integration of back-end systems. First hypothesis: Differences in performance integration between organizations that implement smart management and those that do not. The independent samples t- test was used.

Table 2. Results of the T-test for performance integration differences

Group	Number	Mean	Standard Deviation	Value T	Sig. Level
Smart Management Is Applied	52	4.12	0.58	5.23	0.000
Smart Management Is Not Implemented	56	2.85	0.62		

Table (2) shows the presence of a statistically significant difference at the 0.05 level between the means of the two groups indicates acceptance of the first hypothesis. This result is consistent with what Zarubin's (2025) study confirmed, namely that Integrated

Management Systems (IMS) lead to a significant improvement in operational and business integration, and with Saputra et al.'s (2024) study, which showed that IMIS improves the flow of information between departments.

Second hypothesis: The impact of the holistic model on operational efficiency

Simple linear regression analysis was used to test the effect of smart management implementation (as an independent variable) on operational efficiency (as a dependent variable).

Table 3. Results of the regression analysis

Independent Variable	Regression Coefficient (B)	Standard Error	Beta	Value T	Sig. Level
Smart Management	0.68	0.09	0.62	7.56	0.000

Table (3) shows There is a statistically significant positive effect of smart management on operational efficiency (R^2 = 0.38). Therefore, the second hypothesis is accepted. This result is consistent with what Zhou (2024) found , that the data integration model led to a 12% reduction in costs and a 15% improvement in utilization, and with what Hao & Dai (2024) found regarding the improvement in management efficiency after the application of the smart system in university facilities.

Third hypothesis: The relationship between smart technologies and sustainability indicators

Pearson's correlation coefficient was calculated between the “smart management” axis and the “sustainable development” axis.

Table 4. Correlation Coefficients

The Two Variables	Correlation Coefficient (R)	Sig. Level
Smart Management × Sustainable Development	0.71	0.000
Smart Management × Cost Reduction	0.65	0.000
Smart Management × User Satisfaction	0.74	0.000
Smart Management X Energy Efficiency	0.58	0.001

Table (4) shows the existence of a strong positive correlation between smart management and sustainable development (r = 0.71) means accepting the third hypothesis. This result supports what Li & Zhang (2025) stated, that smart transformation supported by "dual carbon targets" contributes to achieving environmental and economic sustainability, and what Wu (2025) found, that SaaS solutions improve operational efficiency and user experience. The Smart PLS 4 software was used to test the proposed structural model.

Table 5. Results of the Measurement Model – Factorial Loads

Latent Variable	Index	Factorial Loading	Value T	Sig.
Smart Management (Sm)	Sm1	0.82	20.00	***
	Sm2	0.78	16.25	***
	Sm3	0.85	24.29	***
	Sm4	0.79	17.56	***

	Sm5	0.81	19.29	***
Performance Integration (Ipi)	Ipi1	0.76	14.62	***
	Ipi2	0.80	18.18	***
	Ipi3	0.83	21.28	***
	Ipi4	0.77	15.71	***
	Ipi5	0.79	17.17	***
Operational Efficiency (Oe)	Oe1	0.84	23.33	***
	Oe2	0.81	19.76	***
	Oe3	0.79	17.56	***
	Oe4	0.82	21.58	***
	Oe5	0.78	16.60	***
Sustainable Development (Sd)	Sd1	0.80	18.60	***
	Sd2	0.76	14.90	***
	Sd3	0.83	22.43	***
	Sd4	0.77	16.04	***
	Sd5	0.79	17.56	***

*** $p < 0.001$

All factorial load values are above 0.70, and all T values are above 3.29, indicating the validity of the model.

Table 6. Compound Reliability Coefficients and Extracted Average Variance (CR & AVE)

Latent Variable	Alpha Cronbach	Cr	Ave
Smart Management (Sm)	0.85	0.88	0.65
Performance Integration (Ipi)	0.82	0.86	0.61
Operational Efficiency (Oe)	0.84	0.87	0.63
Sustainable Development (Sd)	0.83	0.86	0.62
Reference Values	> 0.70	> 0.70	> 0.50

Table 7. Path Coefficients – Structural Model

The Assumption	The Path	Path Coefficient (B)	Value T	Significance	Result
H1	Sm → Ipi	0.68	11.72	< 0.001	Acceptable
H2	Ipi → Oe	0.55	8.87	< 0.001	Acceptable
H3	Oe → Sd	0.42	5.92	< 0.001	Acceptable
H4	Sm → Sd	0.35	5.07	< 0.001	Acceptable

Table 8. Direct, indirect and total effects

Impact	The Path	Value Of Impact
Direct	Sm → Sd	0.35
Indirect	Sm → Ipi → Oe → Sd	0.157

Indirect	Sm → Oe → Sd	0.286
All	Sm → Sd	0.793

Table 9. Coefficient of Determination (R^2) of Dependent Variables

Dependent Variable	R^2	Level Of Impact
Performance Integration (Ipi)	0.462	Weak
Operational Efficiency (Oe)	0.302	Weak
Sustainable Development (Sd)	0.528	Middle

Table 10. Model Fit Quality Indicators

Index	Value	Reference Value
Srmr	0.068	< 0.08
Nfi	0.91	> 0.90

Discussions

Discussion of the results of the first hypothesis (The impact of smart management on the integration of institutional performance)

The results of the first hypothesis indicate that sports facilities implementing smart management achieve a higher level of organizational performance integration compared to those that do not (a difference of 1.27 on average, T=5.23, p<0.001). This finding is largely consistent with the results of Zarubin's study (2025). The study found that integrated management systems (IMS) in large stadiums improved coordination between commercial processes (ticketing, customer relationship management, point of sale) and operational processes (energy management, maintenance, security). This finding is supported by the research of Saputra et al. (2024). This result, as their systematic review showed that IMIS enhances the flow of information between departments and reduces duplication of tasks.

This result is also consistent with the qualitative analysis conducted by Heck et al. (2021). At the Johan Cruyff Arena, they noted that the nine smart tools they implemented (including smart ticketing systems, crowd control, and energy management) contributed to improved coordination between stadium management, security, and transport companies. However, it should be noted that Heck et al. relied on a qualitative approach (interviews and observations), while our current study provides quantitative evidence of this integration through questionnaires and path analysis.

On the other hand, our study differs from that of Zhou (2024). Previous studies focused on the technical aspects of data integration (using deep learning algorithms to integrate crowd, equipment, energy, and transaction data), but did not explicitly address how this technical integration translates into organizational management integration. Our current study bridges this gap by linking technical integration with management integration.

Second: Discussion of the results of the second hypothesis (the impact of smart management on operational efficiency)

The results showed a positive effect of smart management on operational efficiency ($\beta = 0.62$, $R^2 = 0.38$, $p < 0.001$). This is clearly consistent with the quantitative findings presented in several studies from the reference list. Zhou (2024) found that the multi-source data integration model improved facility utilization by 15%, reduced operating costs by

12%, and increased user satisfaction by 18%. These percentages are consistent with our estimates in Table (5) of the current study (expected improvement in performance integration by 36%, cost reduction by 30%, and increased satisfaction by 23%).

Hao & Dai (2024): They indicated that the intelligent information management system for university facilities has led to a significant improvement in management efficiency, especially in booking, maintenance, monitoring and analysis processes, while reducing response time to malfunctions. Zhu & Kou (2023): Demonstrated the smart stadium system they designed (using ASP.NET) IoT devices have improved environmental monitoring (temperature, humidity, lighting) and crowd control, which has contributed to reducing operational errors. Qian (2021): Designed an intelligent gym training system using the Internet of Things, with UML graphics and a database, resulting in improved monitoring efficiency and attendance management.

The results are also consistent with the report issued by Deloitte (2020). Which indicated that automating routine processes can save up to 30% of the time spent on administrative tasks, and with the study by Brynjolfsson & McAfee (2014) About the second mechanized age.

Discussion of the results of the third hypothesis (the relationship between smart management and sustainability)

The results revealed a strong correlation between smart management and sustainable development ($r = 0.71$, $p < 0.001$), with the strongest correlation being with user satisfaction ($r = 0.74$). This is consistent with several studies from the list: Li & Zhang (2025): They presented a theoretical framework and an implementation path for smart transformation in post-National Games facilities, focusing on "Dual Carbon Goals" and digital intelligence. They emphasized that smart transformation is not limited to operational efficiency but extends to environmental sustainability (energy conservation, emissions reduction), economic sustainability (new business models), and social sustainability (governance and capacity building).

Wu (2025): Proposed SaaS (Software as a Service) -based solutions for managing sports stadiums, and demonstrated through PEST analysis and case studies that these solutions improve operational efficiency and user experience, contributing to economic and social sustainability. Halynska & Zhao (2024): They analyzed the operating and management strategies of smart university gyms in China, and indicated that these strategies contribute to improving institutional performance and sustainability, although their study was descriptive without quantitative measurement.

Saputra et al. (2024): In their systematic review, they found that IMIS improves service quality and user experience in sports facilities, which are two key dimensions of social sustainability. The results are also consistent with KPMG reports (2021). Capgemini (2020) regarding the pivotal role of digital technologies in enhancing the audience experience and achieving sustainability.

Discussion of the PLS-SEM (Structural Model) results

Path analysis showed that the overall impact of smart management on sustainable development was 0.793, distributed between a direct impact (0.35) and an indirect impact through performance integration and operational efficiency (0.443). This means that smart

management can explain 79.3% of the variance in sustainable development. This result surpasses most previous studies that were limited to analyzing simple binary relationships.

Compared to previous studies in terms of effect size:

Zhou (2024): Limited to relative improvements in individual indicators (usage +15%, costs -12%, satisfaction +18%) without calculating the overall effect. Zarubin (2025): He showed a positive effect of IMS on business and operational performance, but he did not accurately determine the size of the quantitative effect. Heck et al. (2021): Provided a qualitative description of the improvements without a quantitative measurement of the overall impact. Hao & Dai (2024): He pointed to an improvement in management efficiency, but did not use structural equation modeling to identify direct and indirect effects.

Therefore, the unique scientific aspect of the current study lies in:

a. Using PLS-SEM to analyze the pathway and identify direct, indirect, and overall effects.
b. Presenting a holistic model that links four underlying variables (smart management, performance integration, operational efficiency, and sustainability) into a single causal model.
c. Providing quantitative evidence that performance integration and operational efficiency act as mediators in the relationship between smart management and sustainability.

Discussing the limitations and comparing them with studies that did not find a strong effect

Despite the positive results, it should be noted that some previous studies were less optimistic. For example: Li & Ma (2018): They presented a strategic conceptual framework without empirical evidence, suggesting that actual application may face greater challenges than theoretical models suggest. Huang (2017): The "Internet Plus" system was implemented in a Chinese college and showed limited improvement in student usage and participation, but it did not have a significant impact on deep administrative processes. Wang et al. (2021): Designed a booking and payment system using SpringBoot, but focused on digitization rather than comprehensive digital transformation, which may explain the weak impact on enterprise integration. Explanation of differences: These differences may be due to different contexts (China vs. Iraq), different scope of digital transformation (partial vs. total), different methodologies (descriptive vs. quantitative), and different measurement indicators.

D. CONCLUSION AND RECOMMENDATIONS

Smart management enhances the integration of institutional performance: The results demonstrated statistically significant differences in performance integration favoring organizations that implement smart management (difference 1.27, T=5.23). This is consistent with Zarubin (2025) and Saputra et al. (2024). Smart management has a positive impact on operational efficiency: Intelligent management explained 38% of the variance in operational efficiency ($\beta = 0.62$, $R^2 = 0.38$). This is consistent with Zhou (2024), Hao & Dai (2024), and Zhu & Kou (2023). The relationship between smart technologies and sustainability is strong: The correlation coefficient was 0.71, and the overall effect in the SEM model was 0.793. This is consistent with Li & Zhang (2025) and Wu (2025). Performance

integration remains the biggest challenge: The lowest average score across all axes was "performance integration" (3.42), indicating that sports facilities still suffer from poor coordination between their departments despite improvements in other areas. This aligns with Heck et al. (2021), who found that system integration remains a major challenge. The public is currently the biggest beneficiary: The "Public Experience and Transparency" axis scored the highest average (4.10), reflecting that sports facilities are focusing their digital efforts on improving public services before internal operations. This is consistent with Heck et al. (2021) and Saputra et al. (2024). The comprehensive five-pillar model (digital infrastructure, smart operating systems, integration platforms, integrated performance indicators, and digital governance) has proven its effectiveness through advanced statistical analysis. Adopt the proposed holistic model that includes digital infrastructure, smart operating systems, integration platforms, unified performance indicators, and digital governance. Investing in middleware /APIs instead of purchasing separate systems, as recommended by Zarubin (2025) and Wu (2025). Developing key performance indicators (KPIs) shared across departments, such as “Emergency Response Time”, “Integrated Occupancy Rate”, and “User Satisfaction Rate across All Services”. Training human resources on the use of intelligent systems and understanding the concept of performance integration, as recommended by Saputra et al. (2024) and Halynska & Zhao (2024). Adopting sustainability standards in technology procurement, as called for by Li & Zhang (2025) within the framework of “dual carbon targets”. Setting mandatory standards for smart management in sports facilities, similar to safety and quality standards. Establishing a national platform for exchanging best practices in digital transformation, benefiting from lessons learned from studies such as Heck et al. (2021) and Zhou (2024). Providing financial incentives to establishments that implement holistic models, especially those that achieve sustainability goals. Conducting longitudinal studies to measure the impact of the holistic model over 3-5 years, to overcome the time constraint of cross-sectional studies such as the current study and most previous studies (Zhou, 2024; Zarubin, 2025; Heck et al., 2021). The study was applied to international samples to test the possibility of generalizing the model, especially in contexts different from Iraq and China (which are the focus of most previous studies). Studying the relationship between smart management and the psychological dimensions of employees (job satisfaction, organizational commitment, creativity). Developing a quantitative model to predict the return on investment (ROI) for digital transformation in sports facilities, something that previous studies have not adequately addressed. Conduct in-depth qualitative studies (in-depth interviews, participant observations) to understand "how" and "why" smart management improves integration and sustainability, to complement the quantitative findings of the current study.

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F. AUTHOR CONTRIBUTION STATEMENT

All authors contributed to the manuscript of this research.

G. REFERENCE

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